

1           1.     An outer rotor type brushless motor comprising an outer rotor having  
2 permanent magnets fixed onto an inner periphery of a cup-like rotor yoke, a stator  
3 including a stator core having a plural of magnetic pole portions protruded on an  
4 outer periphery of an annular portion of said stator core and faced to said permanent  
5 magnets and coils wound on said magnetic pole portions, respectively, a cylindrical  
6 boss disposed on an inner periphery of said annular portion of said stator core, a  
7 rotational shaft extending along an axis of said boss and rotationally supported on  
8 said boss by a bearing with a leading end of said shaft having a center portion of  
9 said rotor yoke fixed thereto and a mounting plate fixed onto an outer periphery of  
10 said boss, a rising portion being provided on the side of an inner peripheral portion  
11 of said mounting plate so as to form at the top of said rising portion a face parallel to  
12 the face of said inner peripheral portion, said boss being formed of resin mold and  
13 extending through a hole in said mounting plate and fixed thereto and said annular  
14 portion of said stator core being fixed directly to the top of said rising portion by  
15 screw.

1           2.     An outer rotor type brushless motor comprising an outer rotor having  
2 permanent magnets fixed onto an inner periphery of a cup-like rotor yoke, a stator  
3 including a stator core having a plural of magnetic pole portions protruded on an  
4 outer periphery of an annular portion of said stator core and faced to said permanent  
5 magnets and coils wound on said magnetic pole portions, respectively, a cylindrical  
6 boss disposed on an inner periphery of said annular portion of said stator core, a  
7 rotational shaft extending along an axis of said boss and rotationally supported on  
8 said boss by a bearing with a leading end of said shaft having a center portion of  
9 said rotor yoke fixed thereto and a mounting plate fixed onto an outer periphery of  
10 said boss, said boss being formed of resin mold, an annular rising portion being  
11 formed on the side of an inner peripheral portion of said mounting plate so as to  
12 form at the top of said rising portions a face parallel to the face of said inner  
13 peripheral portion, said annular rising portion being integrally inserted into said boss  
14 so as to be fixed thereto when said boss is molded and said annular portion of said  
15 stator core being mounted on and fixed directly to said face at the top of said rising  
16 portion by screw.

1           4.     An outer rotor type brushless motor comprising an outer rotor having  
2 permanent magnets fixed onto an inner periphery of a cup-like rotor yoke, a stator  
3 including a stator core having a plural of magnetic pole portions protruded on an  
4 outer periphery of an annular portion of said stator core and faced to said permanent  
5 magnets and coils wound on said magnetic pole portions, respectively, a cylindrical  
6 boss disposed on an inner periphery of said annular portion of said stator core, a  
7 rotational shaft extending along an axis of said boss and rotationally supported on  
8 said boss by a bearing with a leading end of said shaft having a center portion of  
9 said rotor yoke fixed thereto and a mounting plate fixed onto an outer periphery of  
10 said boss, said boss being formed of resin mold, a flange being protruded on the  
11 outer periphery of said boss, an annular rising portion being provided on the side of  
12 an inner periphery of said mounting plate, an annular peripheral portion provided at  
13 the top of said rising portion and having a face parallel to said mounting plate being  
14 mounted on said flange of said boss, said annular portion of said stator core being  
15 mounted directly on an inner peripheral portion at the top of said rising portion, and  
16 said annular portion of said stator core, said inner peripheral portion of said  
17 mounting plate and said flange of said boss being tightened by screws extending  
18 through them.

1           11.    An outer rotor type brushless motor comprising an outer rotor having  
2 permanent magnets fixed onto an inner periphery of a cup-like rotor yoke, a stator  
3 including a stator core having a plural of magnetic pole portions protruded on an  
4 outer periphery of an annular portion of said stator core and faced to said permanent  
5 magnets and coils wound on said magnetic pole portions, respectively, with coil  
6 insulation layers provided between said magnetic pole portions and said coils,  
7 respectively, a cylindrical boss disposed on an inner periphery of said annular  
8 portion of said stator core, a rotational shaft extending along an axis of said boss  
9 and rotationally supported on said boss by a bearing with a leading end of said shaft  
10 having a center portion of said rotor yoke fixed thereto and a mounting plate fixed  
11 onto an outer periphery of said boss, said boss being formed of resin mold, said  
12 annular portion of said stator core being inserted into an outer periphery of said boss  
13 so as to be fixed thereto, said coil insulation layers of said stator core being formed

14 of resin mold, said annular portion of said stator core being fixed directly to a rising  
15 portion provided on the inner periphery of said mounting plate and said boss and  
16 said coil insulation layers being integrally formed.

1 12. An outer rotor type brushless motor comprising an outer rotor having  
2 permanent magnets fixed onto an inner periphery of a cup-like rotor yoke, a stator  
3 including a stator core having a plural of magnetic pole portions protruded on an  
4 outer periphery of an annular portion of said stator core and faced to said permanent  
5 magnets and coils wound on said magnetic pole portions, respectively, a cylindrical  
6 boss disposed on an inner periphery of said annular portion of said stator core, a  
7 rotational shaft extending along an axis of said boss and rotationally supported on  
8 said boss by a bearing with a leading end of said shaft having a center portion of  
9 said rotor yoke fixed thereto and a mounting plate fixed onto an outer periphery of  
10 said boss, said boss being formed of resin mold, said annular portion of said stator  
11 core being inserted into an outer periphery of said boss so as to be fixed thereto  
12 when said boss is molded, said annular portion of said stator core being fixed to a  
13 rising portion provided on the inner periphery of said mounting plate, a hole being  
14 provided in said rising portion forming an inner peripheral portion at the top of said  
15 rising portion, a plural of radial slots being provided in said inner peripheral portion  
16 around said hole, said annular portion of said stator core being integrally inserted  
17 into said boss at ribs so as to be supported by said ribs of said boss at said slots of  
18 said mounting plate and said annular portion of said stator core being fixed to said  
19 inner peripheral portion of said mounting plate.

1 13. An outer rotor type brushless motor comprising an outer rotor having  
2 permanent magnets fixed onto an inner periphery of a cup-like rotor yoke, a stator  
3 including a stator core having a plural of magnetic pole portions protruded on an  
4 outer periphery of an annular portion of said stator core and faced to said permanent  
5 magnets and coils wound on said magnetic pole portions, respectively, with coil  
6 insulation layers provided between said magnetic pole portions and said coils,  
7 respectively, a cylindrical boss disposed on an inner periphery of said annular  
8 portion of said stator core, a rotational shaft extending along an axis of said boss

9 and rotationally supported on said boss by a bearing with a leading end of said shaft  
10 having a center portion of said rotor yoke fixed thereto and a mounting plate fixed  
11 onto an outer periphery of said boss, said boss being formed of resin mold, said  
12 annular portion of said stator core being inserted into an outer periphery of said boss  
13 so as to be fixed thereto, said coil insulation layers of said stator core being formed  
14 of resin mold, said annular portion of said stator core being fixed to a rising portion  
15 provided on the inner periphery of said mounting plate, a hole being provided in said  
16 rising portion forming an inner peripheral portion at the top of said rising portion, a  
17 plural of radial slots being provided in said inner peripheral portion around said hole,  
18 said annular portion of said stator core being integrally inserted into said boss at ribs  
19 so as to be supported by said ribs of said boss at said slots of said mounting plate  
20 and said annular portion of said stator core being fixed to said inner peripheral  
21 portion of said mounting plate.

1 14. An outer rotor type brushless motor comprising an outer rotor having  
2 permanent magnets fixed onto an inner periphery of a cup-like rotor yoke, a stator  
3 including a stator core having a plural of magnetic pole portions protruded on an  
4 outer periphery of an annular portion of said stator core and faced to said permanent  
5 magnets and coils wound on said magnetic pole portions, respectively, with coil  
6 insulation layers provided between said magnetic pole portions and said coils,  
7 respectively, a cylindrical boss disposed on an inner periphery of said annular  
8 portion of said stator core, a rotational shaft extending along an axis of said boss  
9 and rotationally supported on said boss by a bearing with a leading end of said shaft  
10 having a center portion of said rotor yoke fixed thereto and a mounting plate fixed  
11 onto an outer periphery of said boss, said boss being formed of resin mold, said  
12 annular portion of said stator core being inserted into an outer periphery of said boss  
13 so as to be fixed thereto, said coil insulation layers of said stator core being formed  
14 of resin mold, said annular portion of said stator core being fixed to a rising portion  
15 provided on the inner periphery of said mounting plate, said boss and said coil  
16 insulation layers being integrally formed, a hole being provided in said rising portion  
17 forming an inner peripheral portion at the top of said rising portion, a plural of radial  
18 slots being provided in said inner peripheral portion around said hole, said annular

19 portion of said stator core being integrally inserted into said boss at ribs so as to be  
20 supported by said ribs of said boss at said slots of said mounting plate and said  
21 annular portion of said stator core being fixed to said inner peripheral portion of said  
22 mounting plate.

1 15. An outer rotor type brushless motor comprising an outer rotor having  
2 permanent magnets fixed onto an inner periphery of a cup-like rotor yoke, a stator  
3 including a stator core having a plural of magnetic pole portions protruded on an  
4 outer periphery of an annular portion of said stator core and faced to said permanent  
5 magnets and coils wound on said magnetic pole portions, respectively, a cylindrical  
6 boss disposed on an inner periphery of said annular portion of said stator core, a  
7 rotational shaft extending along an axis of said boss and rotationally supported on  
8 said boss by a bearing with a leading end of said shaft having a center portion of  
9 said rotor yoke fixed thereto and a mounting plate fixed onto an outer periphery of  
10 said boss, said boss being formed of resin mold and having ribs integrally protruded  
11 from the outer periphery thereof, said annular portion of said stator core being  
12 inserted into an outer periphery of said boss so as to be fixed thereto when said  
13 boss is molded, said annular portion of said stator core being fixed to a rising portion  
14 provided on the inner periphery of said mounting plate, a hole being provided in said  
15 mounting plate, a plural of rising portions being intermittently provided on an inner  
16 peripheral portion around said hole in a circumferential direction, core supports  
17 being provided at the tops of said rising portions in parallel to said inner peripheral  
18 portion, said annular portion of said stator core being mounted on said core supports  
19 and said annular portion of said stator core being inserted into an outer periphery of  
20 said boss when said boss is molded so as to be supported by said ribs above said  
21 inner peripheral portion between adjacent rising portions.

1 16. An outer rotor type brushless motor comprising an outer rotor having  
2 permanent magnets fixed onto an inner periphery of a cup-like rotor yoke, a stator  
3 including a stator core having a plural of magnetic pole portions protruded on an  
4 outer periphery of an annular portion of said stator core and faced to said permanent  
5 magnets and coils wound on said magnetic pole portions, respectively, with coil

6 insulation layers provided between said magnetic pole portions and said coils,  
7 respectively, a cylindrical boss disposed on an inner periphery of said annular  
8 portion of said stator core, a rotational shaft extending along an axis of said boss  
9 and rotationally supported on said boss by a bearing with a leading end of said shaft  
10 having a center portion of said rotor yoke fixed thereto and a mounting plate fixed  
11 onto an outer periphery of said boss, said boss being formed of resin mold and  
12 having ribs integrally protruded from the outer periphery thereof, said annular portion  
13 of said stator core being inserted into an outer periphery of said boss so as to be  
14 fixed thereto, said coil insulation layers of said stator core being formed of resin  
15 mold, said annular portion of said stator core being fixed to a rising portion provided  
16 on the inner periphery of said mounting plate, a hole being provided in said  
17 mounting plate, a plural of rising portions being intermittently provided on an inner  
18 peripheral portion around said hole in a circumferential direction, core supports  
19 being provided at the tops of said rising portions in parallel to said inner peripheral  
20 portion, said annular portion of said stator core being mounted on said core supports  
21 and said annular portion of said stator core being inserted into an outer periphery of  
22 said boss when said boss is molded so as to be supported by said ribs above said  
23 inner peripheral portion between adjacent rising portions.

1 17. An outer rotor type brushless motor comprising an outer rotor having  
2 permanent magnets fixed onto an inner periphery of a cup-like rotor yoke, a stator  
3 including a stator core having a plural of magnetic pole portions protruded on an  
4 outer periphery of an annular portion of said stator core and faced to said permanent  
5 magnets and coils wound on said magnetic pole portions, respectively, with coil  
6 insulation layers provided between said magnetic pole portions and said coils,  
7 respectively, a cylindrical boss disposed on an inner periphery of said annular  
8 portion of said stator core, a rotational shaft extending along an axis of said boss  
9 and rotationally supported on said boss by a bearing with a leading end of said shaft  
10 having a center portion of said rotor yoke fixed thereto and a mounting plate fixed  
11 onto an outer periphery of said boss, said boss being formed of resin mold and  
12 having ribs integrally protruded from the outer periphery thereof, said annular portion  
13 of said stator core being inserted into an outer periphery of said boss so as to be

14 fixed thereto, said coil insulation layers of said stator core being formed of resin  
15 mold, said annular portion of said stator core being fixed to a rising portion provided  
16 on the inner periphery of said mounting plate, said boss and said coil insulation  
17 layers being integrally formed, a hole being provided in said mounting plate, a plural  
18 of rising portions being intermittently provided on an inner peripheral portion around  
19 said hole in a circumferential direction, core supports being provided at the tops of  
20 said rising portions in parallel to said inner peripheral portion, said annular portion of  
21 said stator core being mounted on said core supports and said annular portion of  
22 said stator core being inserted into an outer periphery of said boss when said boss is  
23 molded so as to be supported by said ribs above said inner peripheral portion  
24 between adjacent rising portions.